

Protocol for Response to Possible Anthrax Exposures and 10/12/01 Official CDC Health Advisory

People with “powder” incidents should report them to the local police and/or the nearest Division Office of the FBI as soon as possible (phone numbers provided below). The FBI, local law enforcement, local fire departments, and local hazardous materials teams have primary responsibility for determining the credibility of the threat, and, if the threat is credible, testing of the substance can be performed at a public health laboratory.

FBI Division Offices in Washington:

Western WA – 206-622-0460

Eastern WA – 509-747-5196

Specific guidelines for handling suspicious packages or letters and scenes where there is a suspicious powder are given in the CDC Health Alert which is included at the end of this document and can also be found at:

www.bt.cdc.gov/DocumentsApp/Anthrax/10122001Handle/10122001Handle.asp

Assessment of Individual Risk of Exposure

Much as we do with rabies, it is important to assess the nature of possible exposure to anthrax of any concerned person before deciding on a course of action. Factors that need to be assessed include credibility of the threat and whether the exposure might result in inhalational anthrax or cutaneous anthrax. Again, the FBI, local law enforcement, local fire departments, and local hazardous materials teams have primary responsibility for determining the credibility of the threat. If these threat response personnel believe that the threat is credible, public health should be consulted to help assess whether the exposure might result in inhalational anthrax or cutaneous anthrax.

Credibility

An exposure to a substance may be higher risk if:

- There is a threatening message with the powder or substance
- The substance is brown or sandy-brown rather than stark white. Of note, the positive NBC letter is reported to have had brownish sand-like material in it.
- A suspicious letter or package is involved (see the CDC Health Alert link, above, for details).
- Situations that may be less worrisome for true anthrax/biological agent exposure include:
 - A white powder is found without a note, where one might expect someone to have spilled sugar, flour, etc.
 - A white powder comes in an envelope with expected mail that is easy to trace to the sending source.

Route of Potential Exposure

- Inhalational anthrax generally requires a large dose of invisibly fine powder – particles 1-5 microns in size, the size necessary to get into the alveoli. It is technologically very difficult to get anthrax into a form where it can be inhaled. Re-aerosolization of particles on clothing and on surfaces into particles of this size is nearly impossible. Thus, visible settled powders and letters or boxes that are opened and contain powders are usually not serious threats for inhalational anthrax. Thus, the immediate risk to people "exposed" in these situations is small. Inhalational anthrax would be of concern if: a) a person got a face full of fine powder with heavy contamination of eyes, nose and throat; b) there was a real concern of aerosolization based on warning that an air handling system is contaminated or warning that a biological agent was released in a public space.
- Cutaneous anthrax appears to require lower doses and is the most plausible form of anthrax that could be caused by letters and packages that did not have obvious aerosolizing devices – all one needs is spores rubbed into the skin or cuts in the skin. Given its characteristic clinical picture and very good prognosis when recognized and treated, potential exposures can readily be managed by observation and treatment as clinically needed.

Risk-based Medical Management of Possible Exposures

Low-credibility exposure situations and situations with possible cutaneous exposure

- If no clear-cut exposure (e.g., patient was in New York, now has cold symptoms and is worried), provide reassurance to the patient about the rarity of infection without known exposures. We do not recommend collecting a nasal swab or blood for a serologic test to try to confirm that there is no evidence of exposure to anthrax. We do not recommend prescribing prophylactic antibiotics in these situations.
- If the only potential exposure to a powder/suspicious substance is cutaneous (the usual situation with finding powder on a surface, opening a letter with powder in it), provide advice on what to look for (red spot -> papule -> vesicle -> black center over several days to a week), reassure them that cutaneous anthrax can be readily diagnosed and easily treated. We do not recommend collecting a nasal swab or blood for serology in the absence of a skin lesion, nor do we recommend prescribing antibiotic prophylaxis. This situation is analogous to the rabies situation of having a provoked bite from an animal that is highly unlikely to have rabies – e.g., squirrel that bites finger.

High-credibility exposure situations

The situations described below are ones in which the FBI has already deemed the threat to be credible. The local health department should be notified immediately.

- If the situation suggests real potential for inhalational exposure (e.g., got a face and nose full of powder AND FBI has deemed the threat to be credible), consider starting prophylactic antibiotics and continuing them until exposure has been ruled out. (This situation is analogous to starting rabies prevention prior to getting a test result back if there is an animal bite to the face from a likely high-risk exposure – where time is of the essence). If the powder is not available for testing, limited environmental testing of the site where the powder was released (e.g., where the envelope or package was opened) will likely be more sensitive and useful than collecting a nasal swab. Your local health department may have the capacity to conduct this environmental testing if it is warranted.
- If the situation suggests real potential for cutaneous exposure (e.g., direct hand contact with brownish powder AND FBI deems the threat to be credible), provide reassurance and counseling about the signs and symptoms of cutaneous anthrax and wait to start prophylactic antibiotics until culture of the powder is complete. This is analogous to waiting to start rabies treatment pending testing for plausible rabies exposure – e.g., unprovoked stray cat bite on hand – when you have time to sort the situation out. Nasal swab testing is not recommended.
- If the person was potentially exposed to anthrax at the America Media Inc. Building in Boca Raton, Florida, the NBC studio (30 Rockefeller Plaza) in New York City, or the Hart Senate Building in Washington, D. C., please call your Local Health Department for specific guidance.

Nasal swabs

CDC does not recommend the use of nasal swab testing on a routine basis to determine whether a person has been exposed to *B. anthracis* or as a diagnostic tool that would be relied upon to guide prophylaxis and treatment. Their use in recent investigations by CDC has been for epidemiologic purposes only, as an adjunct to an environmental investigation where there is a known exposure event, to help determine the extent of exposure. The sensitivity, specificity, and positive/negative predictive value of nasal swab cultures are unknown. In particular, the sensitivity of this method for detecting exposure to *B. anthracis* spores is unknown.

Serologic testing

CDC does not recommend the use of serologic testing on a routine basis to determine whether a person has been exposed to *B. anthracis* or as a diagnostic tool to guide decision about prophylaxis and treatment. As described above for nasal swab testing, the use of serologic tests in recent investigations by CDC has been for epidemiologic purposes only where there is a known exposure to *B. anthracis*. Again, the sensitivity, specificity, and positive/negative predictive value of serologic tests for *B. anthracis* are unknown.

Prophylactic use of antibiotics

Antibiotic prophylaxis should be limited to those who have a confirmed exposure to *B. anthracis* or who have had a strongly suspected exposure as described above (FBI assessment that the threat is credible and route of exposure is likely to be inhalational, with gross amounts of powder on the face/nose). Indiscriminate use of ciprofloxacin and other antibiotics can contribute to antimicrobial resistance and lessen the effectiveness of these agents against many infections. Inappropriate stockpiling of ciprofloxacin may threaten the supply of this antibiotic should it be urgently required.

If post-exposure prophylaxis is required following a confirmed or strongly suspected exposure to *B. anthracis*, the following regimens have been recommended by the CDC for use of doxycycline or ciprofloxacin:

	Initial therapy	Duration
Adults, including pregnant women and immuno-compromised persons	Ciprofloxacin 500 mg po BID OR Doxycycline 100 mg po BID	60 days (if only suspected but not confirmed exposure, may stop antibiotics if testing of substance rules out exposure to <i>B. anthracis</i>)
Children	Ciprofloxacin 15-20 mg/kg po Q 12 hrs (not to exceed 1 gram/day) OR Doxycycline >8 yrs and >45 kg: 100 mg po BID >8 yrs and ≤45 kg: 2.2 mg/kg po BID ≤8 yrs: 2.2 mg/kg po BID	60 days (if only suspected but not confirmed exposure, may stop antibiotics if testing of substance rules out exposure to <i>B. anthracis</i>)

- If susceptibility testing allows, therapy should be changed to oral amoxicillin for post-exposure prophylaxis to continue therapy out to 60 days.
- Although tetracyclines are not recommended during pregnancy, their use may be indicated for life-threatening illness. Adverse effects on developing teeth and bones are dose-related, therefore, doxycycline might be used for a short course of therapy (7-14 days) prior to the 6th month of gestation.
- Use of tetracyclines and fluoroquinolones in children has potential adverse effects. These risks must be weighed carefully against the risk for developing life-threatening disease. If a release of *B. anthracis* is confirmed, children should be treated initially with ciprofloxacin or doxycycline as prophylaxis, but therapy should be changed to oral amoxicillin 40 mg/kg of body mass per day divided every 8 hours (not to exceed 500 mg TID) as soon as penicillin susceptibility of the organism has been confirmed.

Recognition and diagnosis of patients with symptoms compatible with anthrax (adapted from materials from CDC): Report patients with illness suspected to be anthrax immediately to your local health department.

Signs and Symptoms of Anthrax Infection:

Inhalational anthrax: A brief prodrome resembling a viral respiratory illness followed by development of hypoxia and dyspnea, with radiographic evidence of mediastinal widening. This is the most lethal form of anthrax and results from inspiration of 8,000-40,000 spores of *B. anthracis*. The incubation of inhalational anthrax among humans is reported to range between 1 and 7 days but may be as long as 60 days. Host factors, dose of exposure and chemoprophylaxis may play a role. Initial symptoms include sore throat, mild fever, muscle aches and malaise. These may progress to respiratory failure and shock. Meningitis frequently develops. Case-fatality estimates for inhalational anthrax are based on incomplete information regarding exposed populations and infected populations in the few case series and studies that have been published. However, case-fatality is extremely high, even with all possible supportive care including appropriate antibiotics. Records of industrially acquired inhalational anthrax in the United Kingdom before antibiotics were available reveal that 97% of cases were fatal. With antibiotic treatment the fatality rate is estimated to be at least 75%. Estimates of the impact of the delay in post-exposure prophylaxis or treatment on survival are not known.

Gastrointestinal anthrax: Severe abdominal distress followed by fever and signs of septicemia. This form of anthrax usually follows the consumption of raw or undercooked contaminated meat and usually has an incubation period of 1-7 days. An oropharyngeal and an abdominal form of the disease have also been described. Involvement of the pharynx is usually characterized by lesions at the base of the tongue, sore throat, dysphagia, fever, and regional lymphadenopathy. Lower bowel inflammation usually causes nausea, loss of appetite, vomiting and fever, followed by abdominal pain, vomiting blood, and bloody diarrhea. The case-fatality rate is estimated to be 25-60%. The effect of early antibiotic treatment on that case-fatality rate is not defined.

Cutaneous anthrax: A skin lesion evolving from a papule, through a vesicular stage, to a depressed black eschar. This is the most common naturally occurring type of infection (>95%) and usually occurs after skin contact with contaminated meat, wool, hides, or leather from infected animals. Incubation period ranges from 1-12 days. Skin infection begins as a small papule, progresses to a vesicle in 1-2 days followed by a necrotic ulcer. The lesion is usually painless, but patients also may have fever, malaise, headache and regional lymphadenopathy. The case fatality rate for cutaneous anthrax is 20% without, and less than 1% with, antibiotic treatment.

Laboratory diagnosis of anthrax infection in patients with compatible symptoms

- Inhalational anthrax: blood gram stain and culture, CSF gram stain and culture (if meningeal signs are present); chest X-ray
- Gastrointestinal anthrax: blood culture
- Cutaneous anthrax: vesicular fluid and blood culture

Evaluation of possible anthrax infection should be performed through standard laboratory tests, following the Laboratory Response Network (LRN [1]) Level A Clinical Guidelines for rule-out and presumptive testing <http://www.bt.cdc.gov/> (follow the link for Resources: Agents/Diseases – *Bacillus anthracis*)

A. Presumptive identification criteria (level A LRN laboratory)

1. From clinical samples, such as blood, CSF, or skin lesion (vesicular fluid or eschar) material: encapsulated Gram-positive rods
2. From growth on sheep blood agar: large Gram-positive rods
3. Non-motile
4. Non-hemolytic on sheep blood agar

Additional LRN level B laboratory criteria for confirmation of *B. anthracis* are available through the Washington State Public Health Laboratory, and involve:

B. Confirmatory criteria for identification of *B. anthracis* (level B LRN laboratory)

1. Capsule production (visualization of capsule), and
2. Lysis by gamma-phage, or
3. Direct fluorescent antibody assays (DFA)

Rapid screening assays, such as nucleic acid signatures and antigen detection, which can be performed directly on clinical specimens and environmental samples, are being made available for restricted use in LRN B and C level laboratories.

If you have any questions about the medical management of persons concerned about exposure to anthrax, call your local health department. If our experience with anthrax exposures changes and there is a need to modify this guidance, we will do so.

This is an official CDC Health Advisory

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HOW TO HANDLE ANTHRAX AND OTHER BIOLOGICAL AGENT THREATS

Many facilities in communities around the country have received anthrax threat letters. Most were empty envelopes; some have contained powdery substances. The purpose of these guidelines is to recommend procedures for handling such incidents.

DO NOT PANIC

1. Anthrax organisms can cause infection in the skin, gastrointestinal system, or the lungs. To do so, the organism must be rubbed into abraded skin, swallowed, or inhaled as a fine, aerosolized mist. Disease can be prevented after exposure to the anthrax spores by early treatment with the appropriate antibiotics. Anthrax is not spread from one person to another person.
2. For anthrax to be effective as a covert agent, it must be aerosolized into very small particles. This is difficult to do, and requires a great deal of technical skill and special equipment. If these small particles are inhaled, life-threatening lung infection can occur, but prompt recognition and treatment are effective.

SUSPICIOUS UNOPENED LETTER OR PACKAGE MARKED WITH THREATENING MESSAGE SUCH AS “ANTHRAX”:

1. Do not shake or empty the contents of any suspicious envelope or package.
2. PLACE the envelope or package in a plastic bag or some other type of container to prevent leakage of contents.
3. If you do not have any container, then COVER the envelope or package with anything (e.g., clothing, paper, trash can, etc.) and do not remove this cover.
4. Then LEAVE the room and CLOSE the door, or section off the area to prevent others from entering (i.e., keep others away).
5. WASH your hands with soap and water to prevent spreading any powder to your face.
6. What to do next...
 - If you are at HOME, then report the incident to local police.
 - If you are at WORK, then report the incident to local police, and notify your building security official or an available supervisor.
7. LIST all people who were in the room or area when this suspicious letter or package was recognized. Give this list to both the local public health authorities and law enforcement officials for follow-up investigations and advice.

ENVELOPE WITH POWDER AND POWDER SPILLS OUT ONTO SURFACE:

1. DO NOT try to CLEAN UP the powder. COVER the spilled contents immediately with anything (e.g., clothing, paper, trash can, etc.) and do not remove this cover!
2. Then LEAVE the room and CLOSE the door, or section off the area to prevent others from entering (i.e., keep others away).
3. WASH your hands with soap and water to prevent spreading any powder to your face.
4. What to do next...
 - If you are at HOME, then report the incident to local police.
 - If you are at WORK, then report the incident to local police, and notify your building security official or an available supervisor.
5. REMOVE heavily contaminated clothing as soon as possible and place in a plastic bag, or some other container that can be sealed. This clothing bag should be given to the emergency responders for proper handling.
6. SHOWER with soap and water as soon as possible. Do Not Use Bleach Or Other Disinfectant On Your Skin.
7. If possible, list all people who were in the room or area, especially those who had actual contact with the powder. Give this list to both the local public health authorities so that proper instructions can be given for medical follow-up, and to law enforcement officials for further investigation.

QUESTION OF ROOM CONTAMINATION BY AEROSOLIZATION:

For example: small device triggered, warning that air handling system is contaminated, or warning that a biological agent released in a public space.

1. Turn off local fans or ventilation units in the area.
2. LEAVE area immediately.
3. CLOSE the door, or section off the area to prevent others from entering (i.e., keep others away).
4. What to do next...
 - If you are at HOME, then dial "911" to report the incident to local police and the local FBI field office.
 - If you are at WORK, then dial "911" to report the incident to local police and the local FBI field office, and notify your building security official or an available supervisor.
5. SHUT down air handling system in the building, if possible.
6. If possible, list all people who were in the room or area. Give this list to both the local public health authorities so that proper instructions can be given for medical follow-up, and to law enforcement officials for further investigation.

HOW TO IDENTIFY SUSPICIOUS PACKAGES AND LETTERS

Some characteristics of suspicious packages and letters include the following...

- Excessive postage
- Handwritten or poorly typed addresses
- Incorrect titles
- Title, but no name
- Misspellings of common words
- Oily stains, discolorations or odor
- No return address
- Excessive weight
- Lopsided or uneven envelope
- Protruding wires or aluminum foil
- Excessive security material such as masking tape, string, etc.
- Visual distractions
- Ticking sound
- Marked with restrictive endorsements, such as “Personal” or “Confidential”
- Shows a city or state in the postmark that does not match the return address

[1] *Laboratory Response Network for Bioterrorism* (LRN) is a collaborative partnership and multilevel system designed to link state and local public health laboratories with advanced capacity clinical, military, veterinary, agricultural, water and food-testing laboratories. The LRN operates as a network of laboratories with progressively stringent levels of safety, containment and technical proficiency necessary to perform the essential rule-out, rule-in, and referral functions required for agent identification. Network access provides all public health laboratories with the means to accept and transfer specimens to appropriate facilities where definitive testing can be undertaken. This facilitates early detection and **suspect-level** identification at the local clinical laboratory level, which is subsequently supported by more advanced capacity for rapid **presumptive and confirmatory-level testing** at state and large metropolitan public health laboratories. Further definitive characterization or highly specialized testing is provided by CDC, which serves as the national public health reference laboratory for major threat agents.